人間社会環境研究　第15号　2008. 3

A Study of Social Inclusion and ICT Engagement in Chūsankanchiiki (mountainous) Regions A Case Study of Kanakura Village, Wajima City

Stuart Healey

中山間地域における社会的包摂とICT利活用に関する一考察 輪島市金蔵村を事例に

社会環境科学研究科地域社会環境学専攻
ヒーリー・スチュワート

抄　録

中山間地域が多種の社会的問題に直面しており，地域発展を支援するツールとして，情報通信技術（ICT）の利活用が推進されている。しかしながら，中山間地域社会では農業や市民社会活動での意思決定において対面型コミュニケーションや郵便，固定電話などの「古いICT」を重んじる。そのため，インフラ未整備や操作能力不足，低所得の問題により，中山間地域ではあまり普及されていないインターネットなどの「新しいICT」の利活用はいかなる影響を与えるのかという複雑な問題を捉える研究が求められている。

本稿は先ずICT利活用が社会への参加過程を強化するという社会的包摂の概念を中山間地域に応用する。それから，古いICTも新しいICTも両方利活用している中山間地域の輪島市金蔵村をケーススタディとし，ICT利活用はいかに社会ネットワークや協調，信頼，相互扶助など，その地域の社会関係資本と絡み合うかを分析していく。家族や友人との強いつながりをいう結束型社会関係資本では農業での強調や自治会の活発さ，交流できる施設の豊富さにより，情報通信技術として古いICTの利活用が中心であることが分かった。一方では，発展の成果を促す外部組織との弱いつながりを指す橋渡し型社会関係資本では古いICT及び新しいICTの利活用が社会参加を強化することが明らかになった。

キーワード：中山間地域，社会的包摂，社会関係資本，デジタルデバイド

1. Introduction

The socioeconomic viability of chūsankanchiiki (mountainous) regions is an ongoing concern. The decline of farming and forestry as a source of employment and income for residents, a rapidly dwindling and ageing population, and subsequent cutbacks in public infrastructure spending have marginalised communities from participation in production activities, labour market, and access to public and private services. Consequently, the number of farmers (and their successors) has decreased sharply; younger residents are driven to urban centres to seek employment; increasing numbers of low-income, single elderly households threaten to test the resolve of regional social welfare services; and a shrinking, ageing population has inevitably weakened community interaction and local democracy.

As a means to address mountainous region communities' socioeconomic decline access to information and communication technology (ICT) is increasingly promoted as a tool to promote socioeconomic development. Announcing its plans to create a "ubiquitous network society" in which digital networks will permeate all aspects of social and economic life across the country, the Ministry of Internal Affairs and Communications' (MIC) 2006 u-Japan White Paper declares that ubiquitous networks underpinned by optical fibre and ultra-wideband (UWB) radio technology will be used to address a range of socioeconomic problems including society and living, labor and employment, medical and welfare, education/human resources, government/ administrative services, transport and distribution, public safety and disaster prevention, international affairs, environment and energy and economy/ industries.[1]

Yet, despite such bold pledges ICT adoption remains low in rural areas, and age and income based ICT take-up disparities refuse to go away. This has sparked debate about digital divides, with discussion usually concentrated on ways to provide the *means* to ICT engagement, such as telecommunications and information infrastructure development or ICT training. While such discourse is vital, there is a need to move the debate on to consider the fundamental yet often unvoiced element of the digital divide debate – the outcome, impact and consequences, or, in other words, the ends of engaging with ICT. This raises a number of issues, such as how could ICT improve the social quality of mountainous region community members? Also, what affect could the introduction of new information and communication technology have on existing social practices, insofar as could it potentially weaken social practices?

In order to examine the consequences or potential consequences of ICT engagement for mountainous region communities, this paper proposes the following theoretical framework:

1) It is argued that the impact of ICTs could be seen in terms of how ICT enables people to participate and be part of society[2]. We therefore utilise the social inclusion framework to elucidate the affect of ICT engagement on individuals participation in society
2) The social capital concept is then used to analyse the impact of ICT engagement on existing social practices. For this analysis, we draw on the findings of a case study of a mountainous region village in Noto Peninsula, Ishikawa Prefecture.

2. Mountainous regions and social exclusion/ inclusion

About 70% of land in Japan is considered mountainous, and about 14% of the national population live in such areas. According to the Ministry of Agriculture's Statistics Bureau, mountainous areas are composed of mid-mountainous agricultural land (land interspaced between flat and mountainous regions with excessive sloping ground and a forest density of 50-80%), and mountainous agricultural land (forest density of over 80%, less than 10% arable land).

Shio (2001) argues that mountainous regions are subject to the following disadvantageous conditions:

- *geographical disadvantages* - poor access to urban areas, underdeveloped infrastructure, low agricultural output due to scarce land and temporal conditions;
- *social disadvantages* - ageing population, depopulation, restricted transport infrastructure, poor amenities;
- *economic disadvantages* - small financial scale of local authorities, declining income from farming, lack of employment and business/entrepreneurial opportunities;

- *cultural disadvantages* – lack of cultural institution, underdeveloped telecommunications and information infrastructure, lack of all kinds of information.[3]

In addition, the decline of 'community' in many regional areas, including mountainous areas, has come to the fore in recent years. Yamazaki (2004) talks of a conversion from a 'village' to an 'individualistic' society, resulting in decreased family ties, social interaction, and civic engagement.[4] In the case of mountainous areas, depopulation, conversion to a car society, and a lack of younger people to motivate community events are posited as contributing factors of decreased social and civil engagement.[5]

Reduced income from farming/forestry, infrastructural disparities between rural and urban areas, and a declining sense of community suggest signs of social exclusion in mountainous regions. Social exclusion refers to a state in which sectors of the population are marginalised from socioeconomic processes. To be socially excluded is to be deprived of social recognition and social value, perhaps explaining out-migration trends among the younger population. The concept, which has come to form a chief component of European Union social policy, represents a shift from looking at the socially excluded as 'victims' or an 'underclass,' instead focusing on processes to secure social inclusion by, for example, providing access to employment or training.[6]

Addressing the question of social exclusion and ICT use, Maldonado et al (2006) defined four dimensions of social exclusion which ICT use could impact. These are *consumption, production, civil engagement*, and *social interaction*.[7] Consumption refers to the capacity to purchase goods and services as constrained by low income relative to need. Production includes participation in economically or socially valued activities. Civil engagement is defined as involvement in local or national decision-making activities. Social interaction refers to emotional support or integration

Table 1 – Dimensions of social exclusion in mountainous regions and potential ICT uses

	Consumption	Production	Civil engagement	Social Interaction
Geographical disadvantages	E-shopping enables residents to access goods and services from outside areas	E-commerce enables businesses' to access markets nationwide	E-democracy enables residents/groups to participate in national or supra-national political activities	E-mail enables residents to share information with distant friends/family
Social disadvantages	E-municipality services enables all residents to access public services	E-business enables all residents to participate in business activities	E-voting enables all residents to vote	Blogs/social networking services enable all residents to interact with outside people/groups
Economic disadvantages	E-shopping enables residents/businesses to procure goods or services at a low cost	E-commerce enables businesses to expand sales and marketing activities	E-democracy enables residents/groups to access political information resources at a low cost	Mobile phones enable cost-effective social interaction with outside people/groups
Cultural disadvantages	E-learning enables low-cost access to education/training services	Internet use enables groups/businesses to disseminate cultural information	Internet use enables political groups to disseminate cultural information	Blogs enable people to share cultural information
Community decline	Internet use enables community consumer groups to access information resources	E-business supports community business projects	Mobile phones/email support communication between community group members	Mobile phones/email support interaction between community members

with family, friends or community. The following table describes ways in which ICT could be used to address the cited disadvantages and issues facing mountainous regions.

3. Ambiguous relationship between social inclusion and ICT use

While Maldonado et al's framework elucidates the relationship between social participation and ICT use, it overlooks a number of issues facing mountainous regions. In the performance of multitudinous functions such as the maintenance and management of local agricultural resources, and agricultural production, farming villages rely heavily on relationships of cooperation, trust, and reciprocity. A Ministry of Agriculture, Forestry and Fisheries (MAFF) report (2006) argues that rural villages in Japan possess an inherent consensus-building ability achieved through years of history, tradition, and stability.[8] The Same report contends that these elements represent one of rural villages' greatest assets, and possibly the key to the greater social inclusion of rural communities.

With these thoughts in mind, one question which raises itself concerns whether the implementation of new technology - with all its access and use problems - into communities that thrive on traditional information and communication processes such as face-to-face communication could be instrumental in impeding rather than promoting social inclusion. On the other hand, others postulate that ICTs provide opportunities to overcome barriers (particularly that of distance) to information resources, services and multimedia content[9], while developing beneficial networks through geographic community ICT initiatives that secure the participation of a multitude of community actors in solving local problems with ICT.[10] Also, the potential of interactive web 2.0 technology such as blogs to facilitate knowledge and information sharing via participation in online communities suggest the capability of ICT in building virtual networks.[11]

These points suggest that a major challenge facing policymakers lies in achieving goals of social inclusion while at the same time protecting existing levels of cooperation *within* the village as well as establishing ties with new networks *outside* the village. This challenge dovetails with the social capital framework, which postulates that a combination of both strong social ties, trust and reciprocity within the community – 'bonding social capital' – and weaker ties with outside individuals, communities and organisations – 'bridging social capital' - is conducive to achieving beneficial social outcomes, such as social and digital inclusion. In consideration of strong social cohesion within mountainous region communities and the potential of ICT to develop new social and virtual networks, it could be hypothesised that while ICT is unlikely to play a critical role in developing bonding social capital, it could be instrumental in developing bridging social capital. This hypothesis, however, depends largely on the intensity of the multilayered digital divide between rural-urban regions and its effect on polarising access to information resources.

4. Analytical Framework

To analyse the relationship between social inclusion, social capital and ICT use, this paper examines how social networks enable the flow of *information*. While many studies highlight the somewhat ambiguous relationship between social capital and ICT, a fundamental oversight is that they tend to confuse communication and information with computer-based technologies, such as mobile telephones or the internet. A prominent commentator in social capital discourse, Lin (1999), for example, argues that, irrespective of the conduit utilised, belonging to social networks "facilitates the flow of *information*."[12] Hence, careful examination of *all* existing information flow processes

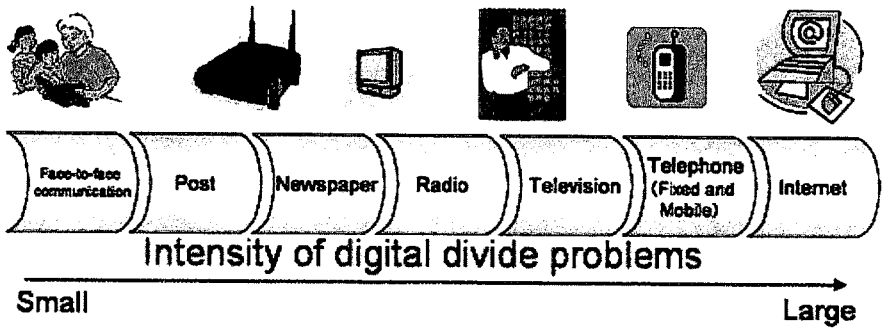


Figure 1 – Methods of communication / information flow

and their relationship with social networks may help us to understand how ICT could impact inclusion in socioeconomic processes.

While an abundance of information flow methods exist, this paper limits examination to information flow methods relative to the immediate community. For this reason, we exclude information methods either instigated or modified by outside entities, such as district newspapers and local television stations. The information flow methods examined in this paper for activities within the village include ①face-to-face communication ② post-based communication ③ fixed telephone ④ mobile telephone ⑤ computer-based internet. Based on data published by Ministry of Internal Affairs and Communications (MIC), it is safe to assume that information flow conducted through mobile telephones and computer-based internet are restricted by infrastructural, age and income disparities.[13] To distinguish between restricted and non-restricted information flow methods, this paper defines all communication and information flow methods carried out via networks and applications using mobile phones and/or personal computers as 'new ICT.' All alternative communication and information flow methods such as face-to-face communication or fixed telephones are classified as 'old ICT.'

Using the above classification of information flow methods, we then examine the relationship between information flow, social capital and social inclusion based on Maldonado et al's defined dimensions of participation in society – *consumption, production, civil engagement*, and *social interaction*. Specifically, we examine the relationship between information flow and bonding social capital in the following areas:

- *Consumption* – consumption of public services. By maintaining an infrastructure of public services and facilities, such as public transport, it sustains participation needed to create social capital[14]
- *Production* – farming activities. Through common property management, risk management, agricultural productivity, agricultural product marketing, and vertical relations, farming plays a key role in social capital development in rural society[15]
- *Civil engagement* – neighbourhood group activities. By empowering local residents to participate directly in civic activities, neighbourhood associations in Japan are seen as vital instruments of social capital development[16]
- *Social interaction* – interaction through formal and informal social networks. Prevalence of social networks are essential to social capital development.[17] We also examine the importance of providing facilities and occasions for people to gather and meet

We then examine the relationship between information flow and bridging social capital in the

following area:

- *Consumption / Production / Civil Engagement / Social Interaction* – regional development movements such as *machiokoshi* (town revitalization) and *chiiki nougyou* (regional farming) groups aim to increase participation in all of the defined dimensions. As a means to drive local development, there have been moves (such as the Ministry of Agriculture, Forestry and Fisheries' recently enacted "Basic Plan for Food, Agriculture and Rural Areas") to strengthen regional competitiveness by promoting endogenous regionalization initiatives that exploit local resources. Many of these regional development movements combine increased innovative and competitive agriculture processes such as organic farming and regional brand creation with regional development initiatives aimed to promote increased rural-urban interaction, such as "green tourism."

5. Study Agenda

The purpose of this study is to examine the relationship between social capital and information flow methods and information-seeking behaviour in the pursuance of participation in socioeconomic processes. For this analysis we draw on the findings of a case study of a mountainous region community in Kanakura village, Noto Peninsula. This village was chosen because of its adoption of diverse information flow methods, ranging from face-to-face communication to interactive web 2.0 technology to strengthen participation in socioeconomic processes.

Taking into consideration mountainous regions' social characteristics and new ICT adoption hurdles, one could argue that in pursuance of participation in socioeconomic processes, Kanakura village's bonding social capital is likely to have a closer relationship with old rather than new ICT. It could also be added that due to growing mobile phone diffusion, the relationship between mobile telephone use and bonding social capital is likely to be strengthening, in some cases equalling or surpassing level of use of old ICT such as fixed telephones and postal services.

One could also argue that taking into account the iterative relationship between social networks and ICT, the relationship between new ICT and Kanakura village's bridging social capital is likely to be stronger than the relationship with old ICT such as fixed telephones and postal services. However, considering the multitudinous hurdles to new ICT adoption; particularly computer-mediated internet use; old ICT such as face-to-face communication is still likely to play a significant role in developing bridging social capital. The following diagram summarises this hypothesised relationship between social inclusion, social capital and ICT use.

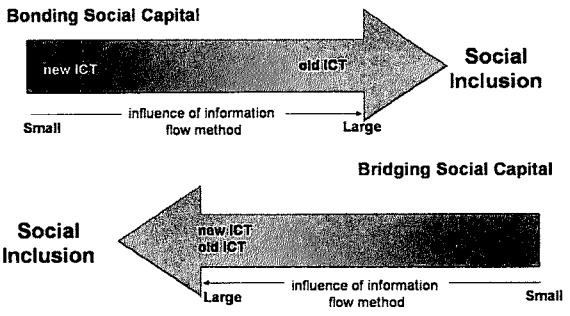


Figure 2 – Relationship between ICT use and social inclusion

6. Methodology

We first establish the state of the digital divide in Kanakura village by examining new ICT infrastructure quality in the Wajima City region. For this appraisal, we rely on an interview conducted with Wajima City's ICT Promotion Chief, Sakashita Toshie. The extent of new ICT adoption and use by Kanakura village residents subject to age and income is then examined based on qualitative interviews with Kanakura village residents (*n=15*).

We then examine the relationship between information flow and both bonding and bridging social capital utilising qualitative interviews with both Kanakura village members (*n=15*; same sample as above), and the village's local development group, Kanakura School (*n=3*).

Table 2 describes the gender, age, and income distribution of the Kanakura village members who took part in the survey. It is necessary to point out here that although the age distribution for the survey respondents closely reflects the age breakdown of all village residents, the number of men and higher income village members who answered the survey were disproportionately high. All interviews took place during November, 2006.

7. Case study analysis

7.1 Introduction to Kanakura village

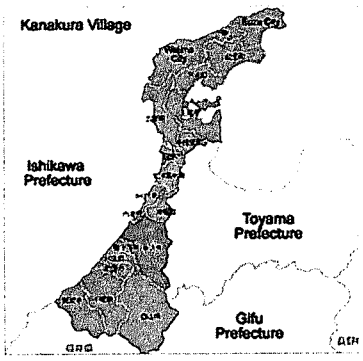
The literal translation of the name Kanakura is "treasure store." Located in basin land situated along the River Machino between mountainous terrain and the coastal plains of western Machino, the area was a strategic location for local warlords who used it as a place to store riches, hence the name. With these riches came regional wealth, epitomised by the abundance of Buddhist Temples built in the area. During the Muromachi period (circa 1333-1573) the original temples were raised to the ground by an envious neighbouring warlord but 5 temples were rebuilt and these still remain today. Kanakura's long and rich history has been recorded in a number of books and often features in local tourist guides.

As shown by Figure 3, Kanakura village sits just inside the border between Wajima City and the neighbouring administrative region of Suzu City. By car, it takes approximately two hours to arrive in the prefectural capital of Kanazawa City. The nearest airport, Noto Airport, constructed in 2005, is approximately a thirty minute journey from the village. The village is surrounded by low mountains and dense woodland, the highest peak being Kanakura Mountain at approximately 200m. The village, which is composed of three separate hamlets, has an overall area of approximately 4 kilometres.

Signs of social exclusion have surfaced in Kanakura

Table 2 – Gender, age, annual income distribution for sample (*n=15*)

		% of village population	% of sample
Gender	Men	43.89%	66.67%
	Women	56.11%	33.33%
Age	Below 60 years	47.3%	53.33%
	60 years and above	52.7%	46.67%
Annual Income	¥2,000,000 and below	35.82%	20%
	¥2,000,001-¥10,000,000	47.76%	40%
	¥10,000,001 and above	16.42%	40%



Administrative Region:	Machino Town, Wajima City
No. of Households:	72* (now reduced to 67**)
Total Population:	180* (now reduced to 167**)
Gender Breakdown:	Male: 79; Female:101*
Age Breakdown:	Below 60 years - 47.3%; 60 years and above - 52.7%**
Average household income:	¥4,629,300***
Land under cultivation:	31. 2 hectares****
Distance to Kanazawa:	Approx. 2 hours
Distance to Noto Airport	Approx. 20 minutes

Figure 3 – Map of Ishikawa Prefecture showing Kanakura village's location

* 2005 National Population Census
** Literature published by Kanakura School in 2006
*** An independent survey conducted by Kanakura School members on behalf of this study
**** 2000 MAFF Shūraku Kaado

village. The decline of farming as a primary source of income for farm households and a general lack of employment opportunities has triggered severe depopulation and population ageing trends. The MAFF 2000 Census recorded that Kanakura's farm household population (15 years old and above) had declined to 201 from 342 thirty years earlier - a decrease of 41.23%. As of 2006, the current total population now stands at 164 people living in 67 households. Of the population remaining, over half are aged above 60 years. The percentage of village residents aged over 60 is 52.7%, and people aged over 70 now account for 49% of the population. A worrying consequence of depopulation and population ageing is the rapidly rising amount of low-income single elderly households. There are currently 15 single elderly households; almost a quarter at 22.4%; 8 of which subsist solely on a national pension. Income received from a national pension amounts to approximately ¥400,000 (US$3,300) per year. While the average income per household in Kanakura village is ¥4,630,000 (US$38,198), this figure drops substantially to ¥920,000 (US$7,520) for single households.

7.2 Information flow methods: An overview of restricted methods

7.2.1 New ICT and infrastructure, ability and costs

DSL broadband services are available to Wajima City residents via analogue airwaves, however, due to the mountainous topography of the region, signals are weak in many areas. Indeed, up to 43% of households in the Wajima City region are located in so-called "poor reception areas."[18] Of the major mobile phone carriers, DoCoMo and AU phones can be used but SoftBank reception is poor.

Household CATV penetration figures currently stand at 0% since cable TV infrastructure is yet to be installed. This is all set to change however. Coinciding with the scheduled transition to a digital broadcasting system from the current analogue system in 2011 and the aforementioned reception difficulties, plans to install broadband services via a cable T.V. network (CATV) infrastructure were announced by Wajima City in 2006. Installing the necessary infrastructure will inevitably take time to complete with some areas getting the services before others. For instance, villages located in the mountainous region of Machino, including Kanakura village, will be one of the last areas to receive CATV broadband services, estimated

Table 3 – Nationwide, Hokuriku, Ishikawa, and Wajima ICT diffusion rates*

Indicator	Diffusion Rates			
	Nationwide	Hokuriku	Ishikawa	**Wajima**
Mobile phone, PHS	76.4%	69.8%	73.7%	**Unknown**
Household broadband	48.9%	48.6%	45%	**25%****
Household CATV	38.0%	44.7%	27.2%	**0%**
Local authority community wireless system	94.1%	92.2%	84.2%	**100%****
School high-speed internet connection	89.1%	86.9%	89.2%	**100%****
Classroom LAN	50.6%	-	72%	**Unknown**

* Hokuriku Telecommunications White Paper (2006)[19]

**Due to a lack of official statistics, these figures reflect verbal estimates given by Sakashita Toshie, Wajima City's IT Promotion Chief on 18th November 2006

to be sometime between 2008 and 2009.

Survey results show that the region sits mainly on the wrong side of the digital divide. According to an interview with Wajima City ICT Promotion Chief, diffusion rates in Wajima for mobile phone/PHS, local authority community wireless system, school high-speed internet connection and classroom LAN exceed the national average but household broadband (DSL), household cable television (CATV) diffusion rates are lower.

While the e-Japan Strategy pledges to digitalize local authority services via a series of regional public networks, many regional areas still await access to such services. In Hokuriku District, services such as online book searches and reservations are offered by 80% of libraries, yet the number of hospitals that offer online medical advice and diagnoses is only 3%.[20] Other services such as local tax declarations and various administrative payments have not been digitalized at all with over 70% of the local authorities surveyed answering that they have no plans to enforce such changes. In the case of Wajima City, while the city has established a website providing information about its services, most e-government services are yet to be implemented.

With regard to Internet penetration, an independent survey conducted by Wajima City showed that most of its citizens had still to go online.[21] According to the survey findings, 68.9% of the population had never used the Internet. Of the 25.7% who replied that they had used the Internet, 13.6% access the net from home, 7.6% go online both at home and at their workplace or school, and the remaining 4.5% only go online from a place of work or school. ICT training for adults is provided but only takes place four times a year at an educational institution located in the city, thirty minutes by road from Kanakura village.

Of the 15 people interviewed in Kanakura village, 14 people own mobile phones, four own PCs, and two are connected to the Internet from home. The four people who owned PCs admitted to have limited ICT skills. None, for example, had homepage or blog-making experience.

The survey results clearly show ICT adoption disparities based on age and income. Survey findings also indicate a shrinking of the mobile phone based digital divide. While less than 15% of people aged above 60 use the Internet, the figure rises substantially to 37.5% for people aged below 60 years. The only people found to use the Internet were all in the ¥10,000,000 and above income bracket. With regard to mobile phone use, over 80% of people aged above 60 years, and 67% of people in the lowest income bracket own a mobile phone.

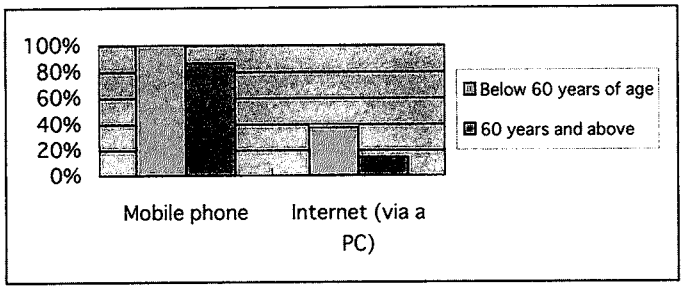


Figure 4 – 'New' ICT adoption based on age

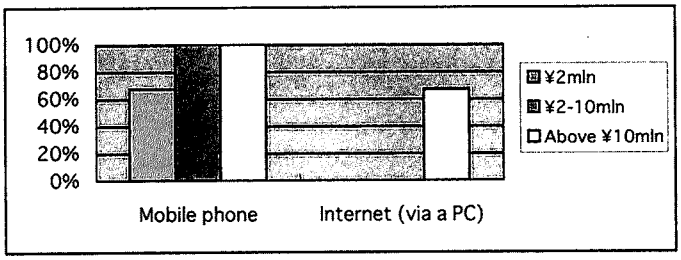


Figure 5 – 'New' ICT adoption based on income

7.3 Relationship between social capital and information flow in Kanakura village

7.3.1 Participation in consumption activities

Since no private stores or public offices exist in the village the consumption of goods and services is reliant on trips to Machino, located approximately 2 kilometres from Kanakura village. Machino is home to a variety of public amenities including an elementary and middle school, stores selling a variety of goods including fresh food, newspapers, clothes, medicine as well as offering prescription services. There is also a small hospital, a post office, bank, and bus stop for people wishing to go to Wajima city centre. The Machino based *shisho* (municipality branch office) provides a range of administrative services such as family registration.

Access to goods and services, however, are limited for certain sectors of the community by a paucity of transport facilities. Public transport is limited to an infrequent bus service (4 buses a day) terminating at nearby central Machino. Bus stops are scarce (3 located over 4 kilometres), and are too far to walk for many elderly residents. One elderly survey respondent said that because she was unable to walk to the nearest bus stop because of the distance, sloping roads and her own physical infirmity, she was often forced to rely on taxi services to reach nearby services. The taxi fare costs ¥1,100, eleven times the bus fare, which costs ¥100.

Concerns were also expressed by survey respondents at understaffed hospitals in the area. The nearest hospital from the village centre (approximately 2 kilometres) in Machino has only one full-time doctor, aged 78 years.

Bonding social capital and information flow methods

Survey results show that most village residents favour face-to-face communication as an information flow method in public services consumption activities. Interviewees responded that information is circulated between family and friends in the community or by visiting the municipal office and requesting

information or advice. Visiting the municipal office was cited as a popular method because of the relative proximity of the local municipal office in Machino and the helpfulness of the staff. Staff consist mainly of local, middle-aged women, who are friendly and familiar faces to village residents, particularly older people.

Alternative information flow methods include post-based communication such as information sheets issued by the local municipal office to local residents. Using a fixed telephone to contact the local municipal office was also cited as a common method to request information.

While mobile phones were cited as an information flow method for public services related information, interviewees responded that they rarely use a mobile phone to contact the local municipality office because the number is not saved under their list of contacts. Numbers deemed important or necessary enough to be saved as a contact in a mobile phone are usually reserved for family, friends or work-related contacts. Technological problems also prevent people from calling for information from a municipal office. Many of the older people interviewed stated that they rarely use mobile phone functions such as address book. None of the interviewees replied that they used the internet to access information about public services. This is obviously largely due to low internet diffusion in the village. Of those that use the internet, while most were aware of Wajima City's homepage, none replied that they use it as a source of information.

7.3.2 Participation in production activities

The future of farming as a source of employment and income in the village is uncertain. Although most households continue to undertake farming activities of some sort, the majority of those below retirement age rely mainly on income from alternative work. The MAFF 2000 Census showed that only 3 part-time farmers considered farming their main occupation. Once the main source of income for households in the region, farming now occupies a mere 3.4% of income for the entire village. Farming decline has inevitably caused widescale arable land abandonment. According to figures published by the 2000 MAFF Census, the area of land under cultivation in 1970 was 61.7 hectares compared to 35.49 hectares in 2000.

Bonding social capital and information flow methods

Farming activities thrive on trust, cooperation, and a myriad of reciprocal arrangements Farmers in the village regularly loan each other farming equipment and machinery, and labour and expenses relating to the upkeep of farming resources such as irrigation reservoirs is pooled between village members. Kanakura village's pool management system operates efficiently because farmers have known each other and cooperated over a long period, inevitably leading to relationships of thick trust and reciprocity. One interviewee commented that Kanakura's pool management ethos is essential to the maintenance of cooperative and harmonious relationships in the village.

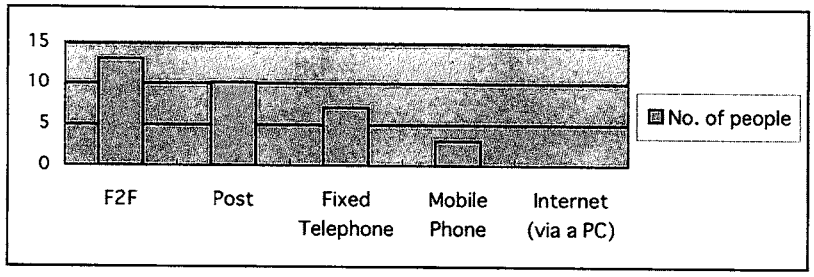


Figure 6 – How do you gain information about public services? (multiple answers given)

In order to cope with worsening depopulation, depopulation and arable land abandonment Kanakura village farmers recently established a new farmer group called the "Farm Management Club". The club fosters cooperation and reciprocity between village farmers. Younger farmers aid older farmers no longer able to cope with physically intensive agricultural labour who in return help out with less strenuous but time-consuming activities such as weed management.

Information flow methods in farming activities are dominated by face-to-face communication. Meetings held by local farmers or the farmers' cooperative at the village hall were cited as a common method of information retrieval. Visiting the local farmers' cooperative office (JA) in Machino for consultation has traditionally been one of the main ways to obtain farming information, yet many village residents complained about the "coldness" of JA employees towards small-scale farmers. Kanakura School members stated that relations with the local JA office had become strained since they started selling rice directly to consumers instead of via the farmers' cooperative.

Postal methods include information sheets distributed by *jichikai* (the residents' association) or the local farmers' cooperative. With regard to new ICT, while 40% (6 people) of village residents retrieve information using a mobile phone, only 6.67% (1 person) uses the Internet to obtain farming-related information. The internet user commented that internet is used to obtain market information about crop prices, and educational information relating to fertiliser and insecticide use.

7.3.3 Civil engagement

The survey findings suggest that depopulation and population ageing have negatively impacted inclusion in local democracy. A lack of younger people in the village has reduced the number of neighbourhood associations – vital organs of civil engagement. For example, in response to a steady decline of children in the village, Kanakura village's elementary school was forced to close down, spelling the end of the Parents and Teachers Association (PTA). In addition, the once influential *seinendan* (young men's association) has been abandoned, and the *souseikai* (men's club) has been temporarily disbanded.

Bonding social capital and information flow methods

Maldonado et al's model looks at participation in local and national decision making processes, however, since this paper focuses on the community's direct participation in socioeconomic processes, this paper focuses only on village members' participation in local government activities rather than their indirect participation in national government.

Neighbourhood associations are important agents of bonding social capital. By empowering local residents to participate directly in civic activities, they foster social interaction, cooperation and civic pride.

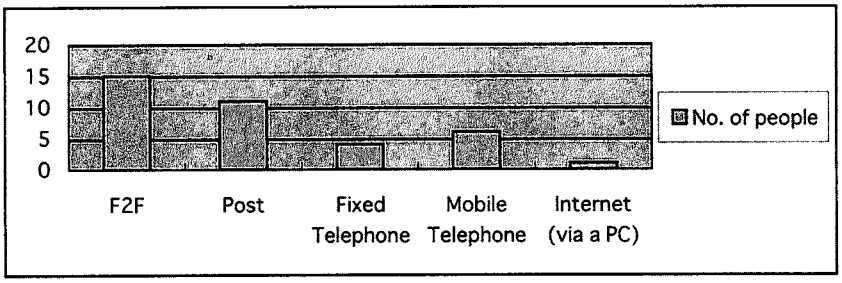


Figure 7 – How do you gain information about farming? (multiple answers given)

Table 4 – Kanakura Village Neighbourhood Associations*

Organisation	Frequency of meetings	Activities	Participant Characteristics	Characteristics	
				Participation	Relationship to govern.
Neighbourhood Association	3 times a year	Neighbourhood administration, arable land management, conservation of water resources	Representatives elected by village members	Compulsory	Associated
Men's Society	Approx. 3 times a year	Not specified	Men aged from 18 to 59 years	Voluntary	Independent
Seniors Association	Twice a month + twice a year trip to a hot spa	Weed management, grass-cutting, educational tours, karaoke trips	Men aged 60 and above	Voluntary	Independent
Ladies' society	Once every 3 months	Weed management, cooking society, educational tours, karaoke	Women only	Voluntary	Independent
Neighbourhood Watch Group	Twice a year	Fire drill, fire-pump maintenance	Men only	Compulsory	Associated
Kanakura School NPO	Approx. once a month but increases during busy periods	Agricultural initiatives, agricultural land conservation, living environment improvements, interaction with outside regions	No restrictions	Voluntary	Associated
Farm Mgmt. Club	Once a week	Collaborative farming – support older farmers	Village residents	Voluntary	Independent
Agricultural Production Union	Not specified	Farm management	Village residents	Compulsory	Associated (Machino Farmers' Cooperative)

* Based on an independent survey by the author

Neighbourhood association activities in Kanakura include maintenance and conservation of pooled farming resources and the natural environment, organizing local festivals, fire prevention, and supporting affiliated children's, women's or elderly people's groups. Table 4 lists the types of neighbourhood associations found in Kanakura village.

While it has been mentioned that groups such as the young men's and men's association have disbanded as a consequence of depopulation, conversely, depopulation and population ageing have engendered increased civil activity in the village. For instance, the recently established Kanakura School seeks the participation or cooperation of local residents in local development activities. Also, participation rates are said to be high for the senior group, which meets regularly for karaoke parties, as well as two trips a year to local hot water-spa. Hospitality for the regular meetings is carried out by the Ladies' Society allowing for interaction between the two groups.

Survey findings show that face-to-face communication and post are by far the most commonly used methods of information retrieval in local government. Residents' association meetings take place three times a year in January, August and December, and are held in the village hall. Issues discussed include election of officers or new members, community events and activities, and budget allocation proposals. The results of these meetings are

communicated to local residents through circular bulletins or sub-neighbourhood group gatherings. Information disseminated to village residents is largely paper-based, such as *kairanban* (circular bulletins).

New ICT is used sparingly to communicate information about local administration. According to an interview with Mr. Araki, the village *ōkuchō*[1] (village chief), this is an intentional rather than a practical decision. Due to the gravity of the information, face-to-face communication through meetings is the preferred form of information circulation in civic engagement. In spite of it sometimes being necessary to produce paper-based circulars, the complexity of residents' association information dictates that verbal, interactive explanation is often more effective than written forms of communication. Mr Araki advised that while new ICT is used to produce documentation, network technologies such as e-mail are never used to distribute text-based documents between residents' association members. However, due to their high diffusion rate and for reasons of convenience, mobile phones are occasionally used for communicating simple information. Mr Araki stated that he sometimes uses a mobile phone to contact other members to confirm meeting times.

Another reason given for a lack of penetration of new ICT in civil engagement is its heavily structured information flow methods. One interviewee likened the flow of information between the town hall,

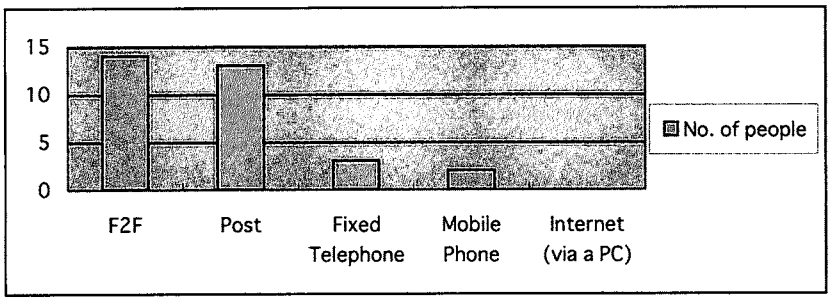


Figure 8 – How do you gain information concerning local administration? (multiple answers given)

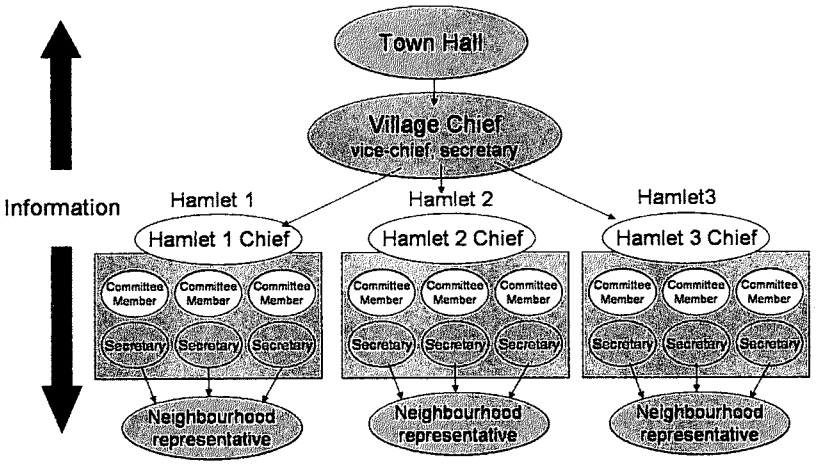


Figure 9 – Flow of information in local government

residents association and local residents to a pyramid system. Information originates from the local town hall, is then passed to the village chief who then submits it to the three *shōkuchō* (hamlet chiefs) who in turn inform households allocated to *jige* (sub-neighbourhood groups). This information flow system is illustrated in the following diagram.

7.3.4 Social Interaction

One of the largest concerns of depopulation and population ageing is decreased social interaction. A declining younger population has signalled the end of a number of social groups, and has also caused a decline in the social welfare of the more vulnerable sectors of the community. Single elderly people interviewed complained of a lack of younger people to assist with physically-intensive duties such as snow-clearing and farm labour. One interviewee, who lives with his elderly mother, replied that he was forced to pay contractors to remove snow from his house costing ¥10,500 (approx. US$90). Restricted mobility impacts levels of social interaction in the village. One elderly lady commented that due to a physical inability to walk around the village's steep roads or tend to her vegetable garden as much as would like, she tends to meet fewer people.

Bonding social capital and information flow methods

As mentioned in the previous section, vibrant participatory activities facilitate social interaction. This is not simply limited to neighbourhood associations but also to non-compulsory, informal social networks including consumer groups, cooking groups and *estei* (beauty, make-up tips etc) groups.

Where Kanakura village differs from many other mountainous region villages is its abundance of facilities and opportunities for people to meet and share information. Like many mountainous region villages, Kanakura village recently lost one of its main institutions, the local elementary school as a consequence of depopulation. However, Kanakura village is host to institutions impervious to the effects of depopulation – Buddhist temples.

Kanakura village is host to 5 temples, 4 of which are aligned to the Jodo Shinshu branch of Buddhism, and 1 to the Shingon sect. Religious festivals take place in the two *omodera* (main temples) once a month, and three times a year in the *kodera* (satellite temples). The temples' abundant religious festivals provide ample opportunities for social interaction and participation within the community. One interviewee stated that the Temples create a valuable outlet for social interaction for single elderly people in the community, largely explaining why so few leave to live with their families elsewhere. In addition, many older women participate in religious festivals by helping to prepare food for worshippers. Table 5 outlines the religious festivals undertaken at each temple.

Face-to-face communication is the preferred form

Table 5 – Kanakura village Buddhist temples and religious festivals*

Name	Temple Type	Sect	Religious Festivals	
			Festival Type	Frequency
Konzou Temple	Main temple	Shingon	Shinran shonin	Once a month
Shougan Temple	Main Temple	Jodo Shinshu	O-kou-mairi	Once a month
Shouraku Temple	Satellite Temple	Jodo Shinshu	Shidou-kyou	Twice a year (March, April)
			Houonkou	Once a year (November)
Kyougan Temple	Main Temple	Jodo Shinshu	O-kou-mairi	Once a month
Entoku Temple	Satellite Temple	Jodo Shinshu	Shidou-kyou	Twice a year (March, April)
			Houonkou	Once a year (November)

* Based on an independent survey by the author

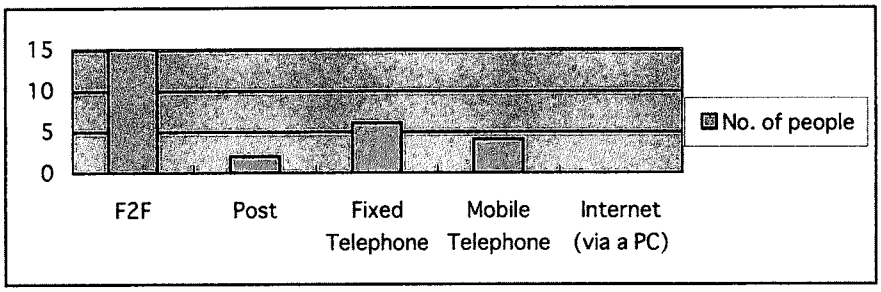


Figure 10 – How do you gain information concerning family and friends? (multiple answers given)

of social interaction within the village. This is aided by the plentiful opportunities for social interaction in the village. Farming activities, participation in a multitude of compulsory and non-compulsory social and civil groups, and an abundance of cultural institutions are all conducive to face-to-face social interaction. As shown by Figure 11, fixed telephone is also used by a significant number of village residents. Many elderly people use fixed telephones due to the manifold problems impeding their mobility.

A tendency for face-to-face social interaction within the village means that with the exception of communicating by mobile phones, new ICT is rarely used. None of the people interviewed replied that they communicate with friends and family in the village by e-mail via a computer.

7.3.5 Participation in local development

As a strategy to enhance the village's inclusion in a wide range of social activities, Kanakura School sets out to promote collaboration within and beyond the immediate community. As the group's charter reads;

In order to rediscover our history and promote creativeness, we will mobilise local resources and bring in resources and knowledge from outside.

Faced with mounting depopulation and population ageing, a number of village residents united to form a local revitalisation organization. The organization, later established as a nonprofit organization (NPO) is named "Kanakura School" after the village's elementary school, which closed as a consequence of depopulation. The name "Kanakura School" not only keeps the name and memory of the closed school alive, it also alludes to a metaphorical school in which people of the village re-educate themselves about the area, its history, culture and society, commonly motivated by a desire to overcome the disappointment of losing a valuable socio-cultural institution. Armed with this increased knowledge and sense of identity, they seek to increase the profile of the area through a wide range of activities, events and information dissemination. As the organisation's Charter reads,

Although the people of the village feel a great loss (at the closure of Kanakura Elementary School), the fighting spirit that endowed us with the first elementary school in Machino still remains, as does our wonderful natural environment, culture, lifestyle and wisdom....The fundamental principle, "You are the teacher, I am the pupil; I am the teacher, you are the pupil" will form the basis of all our discussions relating to thoughts and ideas about history, culture, nature, society, health and livelihood (of the region)

The main activities carried out by Kanakura School are as follows:

- Agricultural initiatives: rice-branding campaign;

cultivation and maintenance of the village's terraced paddy fields; collaboration with local companies to produce rice for sake-making purposes;

- Agricultural land conservation: reservoir and farm road management; arable land preservation and environment conservation; use of volunteers for surrounding forest and woodland management;
- Living environment improvement: azalea and cherry blossom tree planting scheme; creation and maintenance of landmark and road signs; computer skills class;
- Interaction with outside regions: creation of local history map and chronological table; holding events celebrating local history, rice paddy field "owner" system; opening a café inside the Kyougan Temple, which sells dishes made with locally grown agricultural products; maintenance of a rambling route.

The NPO's flagship activity is the "mantoue" (candle-lighting) event held in the village every August. The event embraces the history of the village by commemorating an ancient battle in the village which led to the village and its temples being raised to the ground. Symbolising this battle, single candles are placed in glass cups and positioned in several locations throughout the village, building up in numbers as they lead to the grounds of the temples. The event provides an impressive light show in the evening, supported by other events including traditional dance routines and live music concerts. The event, which has been held annually for the past five years, has risen considerably in stature. It now attracts up to three thousand visitors to the area.

"Green tourism" initiatives designed to increase interaction between rural and urban residents include *nougyou taiken* (farming experience) events allowing urban residents (mainly school children) from urban areas to go to the village to learn firsthand about farming methods and rural life, and try their hand at rice planting or harvesting rice crops. Rice paddy "owner system" initiatives allow people from urban areas to assume part-control in managing and harvesting crops. The fundamental motivation behind green tourism is to educate urban visitors about rural life and agriculture in the hope of increasing interest in farming and attracting permanent residents to rural areas. Also, green tourism activities charge participatory fees so they provide a new source of much needed income for the community, particularly its farmers.

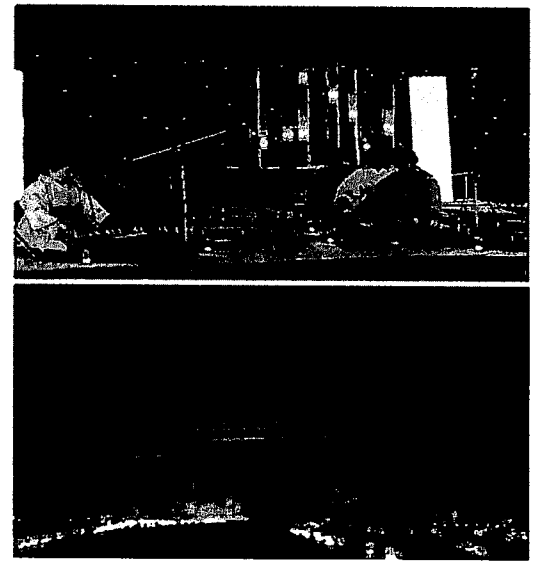


Figure 11 – Kanakura School's mantoue event

Bridging social capital and information flow methods

While Kanakura School activities impact both bonding and bridging social capital, this paper will focus primarily on its bridging social capital focused activities.

Since its establishment, the NPO has been active in establishing a number of strategic and collaborative alliances with organizations within and beyond the community. Within the community, Kanakura School works in close cooperation with the village's main civic body, the local residents association. Beyond the

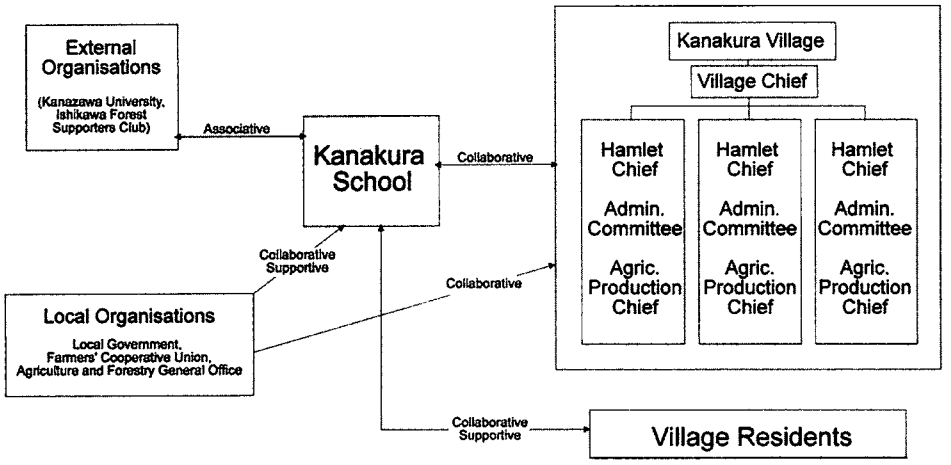


Figure 12 – Kanakura School's network of alliances

community, networks with external organizations have been formed with Ishikawa Prefecture Forest Supporters Club, and a number of universities. At the time of an interview with NPO president Eijun Ishizaki in November 2006, he mentioned the possibility of establishing a new network with Toyama University, which would function under the name of the "Kanakura Study Workshop." Figure 12 describes the network of alliances, the NPO has established with local and external organizations (as of November 2006).

In terms of information flow methods, there is a need to differentiate between information flow among network partners and information disseminated to the general public. Information dissemination to the public usually forms the second stage of information flow between external networks. For instance, in order to disseminate information via broadcast media, contacts are made with the local television or radio station. Alternatively, in order to disseminate tourist related information, contacts are made with local tourist associations and so forth. Thus, forming networks enables widescale information dissemination to the public. The following diagram illustrates Kanakura School's methods of information flow between network partners and the general public.

As shown by Figure 14, information flow between Kanakura School and external organisations is carried out using both old and new ICT. Face-to-face communication is still the most favoured method, however, in recent years, communication is increasingly made via new ICT such as mobile phones and e-mail. Kanakura School president Eijun Ishizaki commented that e-mail is increasingly used to circulate information between network partners such as universities. Such information is contained either within the e-mail message or in attached files such as PDF files, word or powerpoint files. According to Mr. Ishizaki, e-mail has become one of the most effective ways to exchange information with external groups. When it comes to actual decision-making, however, this is usually done in face-to-face scenarios such as meetings. Mr Ishizaki attributes this to people from Noto Peninsula preferring the "personal touch" when communicating.

Information circulated to the general public, on the other hand, is accomplished by a multitude of methods from roadside signs to sophisticated Web 2.0 interactive technology. Looking first at old ICT, Kanakura School members have contacts that work at

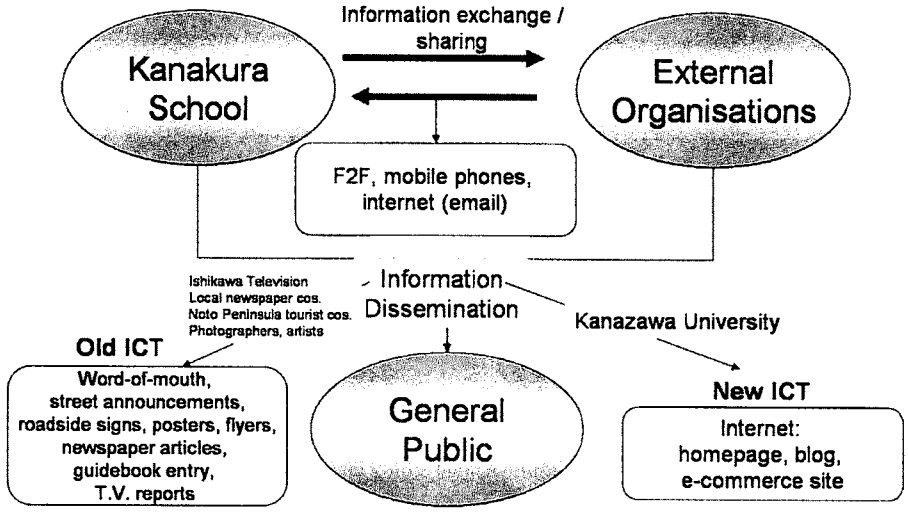


Figure 13 – Kanakura School's information flow between network partners and general public

Ishikawa Television and local newspapers. Kanakura School's flagship *mantoue* (candle-lighting) event held in the village every August is regularly reported by the local T.V. station and press. Kanakura School's active participation in Noto Peninsula tourist campaigns has seen the village regularly mentioned in tourist guidebooks. Networks with local photographers and artists supports paper based information dissemination methods such as posters and flyers.

Information dissemination methods using new ICT have been conducted through its network with Kanazawa University. Kanakura School decided to adopt new ICT as an information dissemination method for the following reasons:

- To 'market' the village as a tourist location, a place to live, and as a high-quality rice producing region through the promotion of Kanakura School's activities, events, and products
- To sell and market locally-produced brand rice and sake
- Provide a means for contacting Kanakura School

Up until last year, sales routes of Kanakura School's brand rice were largely limited to word-of-mouth communication. In 2005, Kanakura School launched a new website to disseminate a wide range of information relating to the group's activities, events and products. The website, however, was limited to static information delivery, infrequently updated and failed to allow for transactional processes such as e-commerce. Owing to the website's low access numbers and limited impact, Kanakura School established a collaborative partnership with Kanazawa University's Information Science Laboratory, to improve the functionality of the website. Undergraduate students, basing their graduation thesis on the project, utilised free blog and e-commerce sites to market the village as a premium rice growing area. enable interactive processes such as online commerce, and to enable information and knowledge exchange with likeminded blog users.

Promoting Kanakura village rice farmers' 'natural' and 'safe' production methods, the students published a blog with weekly articles emphasising the village's natural environment and organic farming methods. This was reinforced with photographs showing the progress of rice crop growth, traditional but now rarely used rice drying methods using a *haza* (a long rack made of wooden poles against which harvested

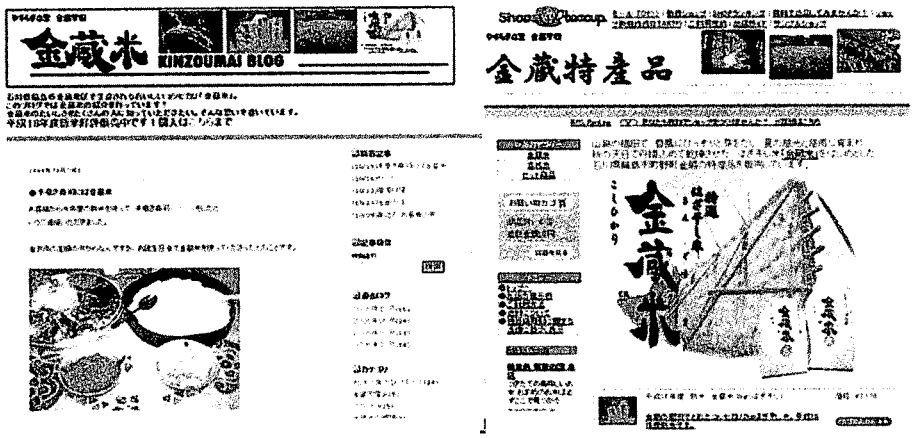


Figure 14 – Kanakura School's blog and e-commerce site

rice plants are leant to dry them out), and pictures of wildlife inhabiting the village's rice paddies and irrigation reservoirs. Green tourism and event related information was also provided. Links from the blog connected to a separate online shopping web site allowing blog readers to buy Kanakura's brand rice or sake online. Utilising a blog also enabled Kanakura School to establish virtual as well as real networks. The students also made use of the blog's 'trackback comment' function, which by exchanging information with other blogs, attracts traffic and content-related comments. For instance, information about rice-based recipes is forwarded to content-related blogs, such as gourmet or rice-related sites, which in turn attracts comments or links from such sites. As a result of using the trackback comment function, knowledge and information was shared with common-interest blog authors and participants.

Compared to the previous homepage, which only attracted 2,000 hits in one year, the blog attracted almost 2,000 hits in September last year alone. The popularity of the blog also translated into increased online sales, accounting for 20% of overall sales in 2006 compared to no online sales in 2005. Using the trackback function was also found to create extra traffic and online rice sales.

8. Case Study Summary

8.1 Bonding social capital and information flow methods

As predicted in Section 5, there is a strong relationship between old ICT and bonding social capital. In all dimensions of social participation, face-to-face communication is the dominant method of information flow. Post and fixed telephone are used at varying levels to supplement face-to-face communication. Paper-based communication plays an important role in circulating information in institutional contexts, while fixed telephone is used as a tool for social interaction between older, less mobile residents.

The influence of new ICT is growing as mobile phones increasingly shape the way people communicate in the village. However, owing to the discussed digital divide problems, and a preference for more traditional forms of communication, computer mediated communication was found to have minimal impact on bonding social capital.

8.1.1 Factors that influence flow methods

Consumption and old ICT

- Face-to-face communication is supported by the

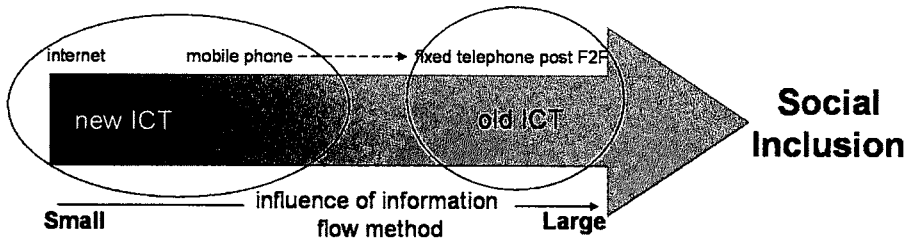


Figure 15 – Relationship between bonding social capital, information flow methods and participation in society

existence of a municipal office that is close to the village, deals with telephone queries, has friendly staff that are familiar to all sectors of the community

- Traditional, long-standing employment of paper-based communication to circulate information

Consumption and new ICT

- Digital divide problems – limited infrastructure, age and income related ICT adoption disparities
- Mobile phone use is increasing, however, proximity and familiarity of municipal office, methods for use, and user limitations deter greater use

Production and old ICT

- Face-to-face communication is enabled by meetings between farmers and farmers' cooperative representatives
- Traditional, long-standing employment of paper-based communication to circulate information

Production and new ICT

- Digital divide problems – limited infrastructure, age and income related ICT adoption disparities

Civil engagement and old ICT

- Face-to-face communication is the preferred form of information flow due to gravity and complexity of information being circulated. This is supported by active participation in an extensive network of neighbourhood groups, and highly structured forms of information flow between local government, residents' association and residents
- Post-based information flow methods, such as circular bulletins, are used to support face-to-face communication, and play an important role in keeping people informed of residents' association movements and decisions

Civil engagement and new ICT

- Digital divide problems – limited infrastructure, age and income related ICT adoption disparities
- A preference for traditional forms of information flow in community and civic affairs due to gravity and complexity of community and civic information

Social interaction and old ICT

- Face-to-face communication is a preferred form of communication. It thrives as a result of participation in farming activities, extensive formal and informal social networks, and an abundance of facilities and events where people can meet and chat
- Lack of access to public transport facilities means that fixed telephones are used to support social ties between less-mobile, older residents

Social interaction and new ICT

- Digital divide problems – limited infrastructure, age and income related ICT adoption disparities
- Mobile phone diffusion means that new ICT is increasingly used as a tool to support social

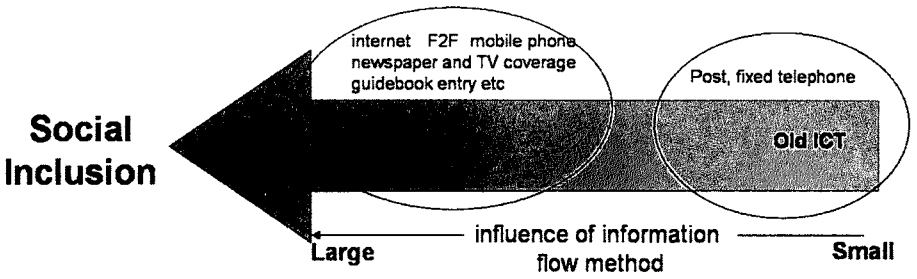


Figure 16 – Relationship between bridging social capital, information flow methods and participation in society

interaction

8.2 Bridging social capital and information flow methods

Both old and new ICT play a crucial role in bridging social capital and the success of local development activities. Mobile phone and e-mail mediated communication increasingly supplement face-to-face communication in Kanakura School's information exchange with network partners. On the other hand, paper-based communication and fixed telephone are used less and less to circulate information between Kanakura School and its network partners. Utilising these networks, the group also exploits diverse methods of information dissemination from road signs to interactive web technology.

8.2.1 Factors that influence flow methods

Local development activities and old ICT

- Due to a preference for the 'personal touch' in meetings, face-to-face communication still plays an important role in network building activities
- Access to extensive networks has enabled Kanakura School to employ a wide variety of old ICT information dissemination methods

Local development activities and new ICT

- A need to circulate complex, text-based information with external network partners has necessitated the use of e-mail
- Access to extensive networks has enabled Kanakura School to employ a wide variety of new ICT information dissemination methods

9 Conclusion

As the "e-Japan Strategy" (revised to the u-Japan Strategy in 2005) reaches its seventh year since implementation, digital divides continue to exist between rural and urban areas, older and younger generations, and lower and higher income bracket households. The Strategy may have faced up to the continued existence of these chasms by bringing affordable broadband connections to most parts of the country through a series of extensive telecommunications reforms, yet, its framework still falls significantly short in considering the potential impact of introducing new, skill-intensive technology into societies that first, lack the resources to use them effectively, and second, have functioned for years without relying on such advancements.

This study succeeded in addressing these topics by moving the debate on from infrastructure based digital inequalities to now-required considerations of how ICT could ultimately impact society. The social inclusion framework allowed us to see how ICT engagement can affect communities and individuals' social quality, and the social capital concept helped to analyse the potential consequences of new information and communication technology on existing social

processes.

The case study showed that existing, more-traditional information flow processes in areas of public service consumption, farming, local government, and social interaction, continue to enable social participation. These processes are in turn supported by strong social networks of cooperation, trust and reciprocity, and a strong public services infrastructure. However, this paper also acknowledged that deteriorating depopulation, population ageing, and public services spending cutbacks threaten to undermine existing high levels of social capital, and ultimately the effectiveness of 'old ICT.' The case study also emphasised the importance of providing adequate public transport, and facilities that enable social interaction, to maintain existing high levels of bonding social capital, and to support increased social participation.

Despite such assertions, an increased role for new ICT could be envisaged. Computer or mobile phone based technology could be used to act as a focus point for local development activities or to support the provision of public services. The case study underlines this point by showing that new ICT engagement provided a focus for network-building in local development activities and as an effective medium for information dissemination to promote such activities. Greater use of new ICT would, of course, require greater commitment from the government to tackle divides based on age and income rather than simply focusing on infrastructural deficiencies. Follow-up study should examine ways to promote social inclusion-focused community ICT initiatives, which at the same time maintain and exploit existing high levels of social capital, as well as addressing digital divide related problems.

In summary, with many mountainous regions increasingly facing extinction, the potential of ICT to support the socioeconomic viability of these socially, economically, and culturally important areas is something that demands urgent attention. Even though mountainous region socioeconomic viability and new ICT use is undoubtedly a complex, multi-layered problem, this study provides a foundation for more realistic, common-sense ICT policies. The challenge now lies with policymakers to stop paying lip-service to ambitious pledges and to expand the debate about digital inequality.

Notes

1) The position is called ōkuchō in Kanakura village, however, in the Japanese language, the more commonly used appellation is daikuchō.

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